

IN THE CLAIMS:

10/529812
JC17 Rec'd PCT/PTO 30 MAR 2005

1. (currently amended) ~~Process~~ A process for preparing an olefin ~~polymerisation~~ polymerization catalyst component in the form of particles having a predetermined size range, said process comprising the steps of:

a) preparing a solution of a complex of a Group 2 metal and an electron donor by reacting a compound of said metal with said electron donor or a precursor thereof in an organic liquid reaction medium;

b) adding said solution of said complex to at least one compound of a transition metal to produce an emulsion the dispersed phase of which contains more than 50 mol% of the Group 2 metal in said complex;

c) agitating the emulsion in order to maintain the droplets of said dispersed phase within such an average size range of 5 to 200 μm ;

d) solidifying said droplets of the dispersed phase; and

e) recovering the solidified particles of the olefin ~~polymerisation~~ polymerization catalyst component;

wherein an aluminum alkyl compound of the general formula $\text{AlR}_{3-n}\text{X}_n$ wherein R stands for a straight chain or branched alkyl group having 1 to 20, ~~preferably 1 to 10 and more preferably 1 to 6~~ carbon atoms; X stands for halogen; and n stands for 0, 1, 2 or 3, is added and brought into contact with the droplets of the dispersed phase of the agitated emulsion before recovering the solidified particles in step e).

2. (original) The process of claim 1, wherein, in step c), the emulsion is agitated in the presence of an emulsion stabilizer and/or a turbulence minimizing agent (TMA).

3. (currently amended) The process of claim 1 ~~or 2~~, further comprising washing and drying said solidified particles prior to recovering the solidified particles in step e) and wherein the aluminum alkyl compound of the general formula $\text{AlR}_{3-n}\text{X}_n$ ~~can be~~ is added and brought into contact with the droplets of the dispersed phase of the agitated emulsion or the solidified particles before recovering the solidified particles in step e).

4. (currently amended) ~~A~~ The process ~~according to any preceding of~~ claim 1, wherein the aluminum alkyl compound of the general formula $\text{AlR}_{3-n}\text{X}_n$ is brought into

contact with the droplets of the dispersed phase of the agitated emulsion before recovering the solidified particles in step e) in an amount so that the final catalyst particles have Al content of 0,05 0.05 to 1 %, ~~preferably 0,1 to 0,8 %, most preferably 0,2 to 0,7 %~~ by weight.

5. (currently amended) A ~~The process according to any preceding~~ of claim 1, wherein an aluminum alkyl compound of the general formula $AlR_{3-n}X_n$ is used, wherein R stands for a straight chain or branched alkyl group having 1 to 6 carbon atoms; X stands for chlorine; and n stands for 0, 1, 2 or 3, ~~is used~~.

6. (currently amended) A ~~The process according to~~ of claim 5, wherein n is 0 and R is ethyl.

7. (currently amended) A ~~The process according to any preceding~~ of claim 1, wherein said Group 2 metal is magnesium.

8. (currently amended) A ~~The process according to any preceding~~ of claim 1, wherein said liquid organic reaction medium comprises a C_6-C_{10} aromatic hydrocarbon or a mixture of C_6-C_{10} aromatic hydrocarbon and $C_5 - C_9$ aliphatic hydrocarbons.

9. (currently amended) A ~~The process according to any preceding~~ of claim 1, wherein said liquid organic reaction medium comprises toluene.

10. (currently amended) A ~~The process according to any preceding~~ of claim 1, wherein said electron donor is ~~an~~ a mono- or diester of an aromatic carboxylic acid or diacid.

11. (currently amended) A ~~The process according to~~ of claim 10, wherein said aromatic carboxylic acid ester or diester is formed in situ by reaction of an aromatic carboxylic acid chloride or diacid dichloride with a $C_2 - C_{16}$ alkanol and/or diol.

12. (currently amended) A ~~The process according to~~ of claim 10, ~~or 11~~ wherein said aromatic carboxylic acid ester is dioctyl phthalate.

13. (currently amended) A The process ~~according to any preceding~~ of claim 1, wherein the preparation of the Group 2 metal complex is carried out at a temperature of 20° to 80°C.
14. (currently amended) A The process ~~according to~~ of claim 13, wherein the Group 2 metal is magnesium and the preparation of the magnesium complex is carried out at a temperature of 50° to 70°C.
15. (currently amended) A The process ~~according to any preceding~~ of claim 1, wherein said transition metal is a Group 4 metal, a Group 5 metal, and/or a Group 6 metal or mixtures thereof.
16. (currently amended) A The process ~~according to~~ preceding of claim 1, wherein said transition metal is Cu, Fe, Co, Ni and/or Pd.
17. (currently amended) A The process ~~according to~~ of claim 15, wherein said Group 4 metal is titanium.
18. (currently amended) A The process ~~according to any of claims~~ claim 15, ~~to 17~~ wherein said compound of the transition metal is a halide.
19. (currently amended) A The process ~~according to any preceding~~ of claim 1, wherein the mol ratio of the transition metal-metal/ Group 2 metal of said disperse phase is 20 to 80.
20. (currently amended) The process ~~according to~~ of claim 19, wherein the mol ratio of the transition metal/ Group 2 metal of said disperse phase is 45 to 75.
21. (currently amended) The process ~~according to any preceding~~ of claim 1, wherein said Group 2 metal complex and said transition metal compound are reacted at a temperature of 10° to 60° C.

22. (currently amended) A The process according to ~~of~~ claim 21, wherein said Group 2 metal complex is a magnesium complex and said transition metal complex is a Group 4 metal compound which are reacted in a temperature range from 20°C to 50°C.
23. (currently amended) A The process according to ~~of~~ claim 22, wherein the Group 4 metal/Mg mol ratio of said denser oil is 2 to 4 and that of the disperse phase oil is 55 to 65.
24. (currently amended) A The process according to ~~of~~ claim 22, ~~or 23~~ wherein the ratio of the mol ratio Group 4 metal/Mg in the disperse phase oil to that in said denser oil is at least 10.
25. (currently amended) A The process according to ~~any preceding~~ of claim 1, wherein said emulsion is composed of a first dispersed phase which is a toluene/TiCl₄-insoluble [-] oil having a Group 4 metal/Mg mol ratio greater than 0.1 and less than 10 and a second disperse phase which is an oil less dense than that of the dispersed phase and which has a Group 4 metal/Mg mol ratio of 10 to 100.
26. (currently amended) A The process according to ~~any of claims claim 2, to 25~~ wherein said emulsion stabilizer is a surfactant.
27. (currently amended) A The process according to ~~of~~ claim 26, wherein said surfactant comprises an acrylic polymer or methacrylic polymer.
28. (currently amended) A The process according to ~~any of claims claim 2, to 27~~ wherein the turbulence minimizing agent is added to the reaction mixture before solidifying said droplets of the dispersed phase, said TMA being inert and soluble in the reaction mixture under the reaction conditions.
29. (currently amended) A The process according to ~~of~~ claim 28, wherein the turbulence minimizing agent is preferably a polymer having linear aliphatic carbon backbone chains, optionally having short side chains, said polymer being preferably

selected from α -olefin polymers having a high molecular weight of MW about $1 - 40 \times 10^6$, or mixtures thereof.

30. (currently amended) A ~~The process according to~~ The process according to of claim 28, ~~or 29~~ wherein the turbulence minimizing agent is selected from the group consisting of polymers of α -olefin monomers with 6 to 20 carbon atoms or mixtures thereof.

31. (currently amended) A ~~The process according to~~ The process according to of claim 30, wherein the turbulence minimizing agent is selected from polymers of octene, nonene, decene, undecene, dodecene, copolymers or mixtures of polymers thereof.

32. (currently amended) A ~~The process according to any of claims claim 2, to 31~~ The process according to wherein the turbulence minimizing agent is added to the emulsion in an amount of 1 to 1.000 1,000 ppm, ~~preferably 5 to 100 ppm and more preferable 5 to 50 ppm.~~

33. (currently amended) Particles of the catalyst component ~~obtainable according to any of claims 1 to 32~~ obtained by the process of claim 1.

34. (currently amended) An olefin polymerisation catalyst comprising particles of the catalyst component ~~obtainable according to~~ obtained by the process of ~~any of claims claim 1, to 32~~ and a cocatalyst, ~~preferably an alkylaluminum cocatalyst and optionally an external electron donor.~~

35. (cancel)

36. (New) The process of claim 1, wherein R stands for a straight chain or branched alkyl group having 1 to 10 carbon atoms.

37. (New) The process of claim 36, wherein R stands for a straight chain or branched alkyl group having 1 to 6 carbon atoms.

38. (New) The process of claim 4, wherein the aluminum alkyl compound of the general formula $AlR_{3-n}X_n$ is brought into contact with the droplets of the dispersed phase

of the agitated emulsion before recovering the solidified particles in step e) in an amount so that the final catalyst particles have Al content of 0.1 to 0.8 % by weight.

38. (New) The process of claim 38, wherein the aluminum alkyl compound of the general formula $AlR_{3-n}X_n$ is brought into contact with the droplets of the dispersed phase of the agitated emulsion before recovering the solidified particles in step e) in an amount so that the final catalyst particles have Al content of 0.2 to 0.7 % by weight.

39. (New) The process of claim 11, wherein said aromatic carboxylic acid ester is dioctyl phthalate.

40. (New) The process of claim 16, wherein said compound of the transition metal is a halide.

41. (New) The process of claim 17, wherein said compound of the transition metal is a halide.

42. (New) The process of claim 23, wherein the ratio of the mol ratio Group 4 metal/Mg in the disperse phase oil to that in said denser oil is at least 10.

43. (New) The process of claim 29, wherein the turbulence minimizing agent is selected from the group consisting of polymers of α -olefin monomers with 6 to 20 carbon atoms or mixtures thereof.

44. (New) The process of claim 43, wherein the turbulence minimizing agent is selected from polymers of octene, nonene, decene, undecene, dodecene, copolymers or mixtures of polymers thereof.

45. (New) The process of claim 2, wherein the turbulence minimizing agent is added to the emulsion in an amount of 5 to 100 ppm.

46. (New) The process of claim 2, wherein the turbulence minimizing agent is added to the emulsion in an amount of 5 to 50 ppm.
47. (New) The olefin polymerisation catalyst of claim 34, wherein the cocatalyst is an alkylaluminum cocatalyst.
48. (New) The olefin polymerisation catalyst of claim 34, further comprising an external electron donor.
49. (New) The olefin polymerisation catalyst of claim 47, further comprising an external electron donor.
50. (New) Use of the catalyst of claim 34 for polymerizing olefins.
51. (New) The use of claim 50, wherein C₂ to C₁₀ α -olefins are polymerized with other α -olefins.
52. (New) The use of claim 51, wherein the C₂ to C₁₀ α -olefins are propylene, ethylene, or copolymers thereof.